BUREAU OF WATER

South Carolina Department of Health and Environmental Control

SHELLFISH MANAGEMENT AREA 06A

2003 ANNUAL UPDATE

Shellfish Sanitation Program

Water Monitoring, Assessment and Protection Division
Environmental Quality Control - Bureau of Water
2600 Bull Street
Columbia, South Carolina 29201

July 2003

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South Carolina Department of Health and Environmental Control

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2003 ANNUAL UPDATE
[Data Through December 2002]

Shellfish Management Area 06A
Shellfish Sanitation Program

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ANNUAL UPDATE
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SCDHEC EQC Bureau of Water

Data Inclusive Dates:
01/01/00 thru 12/31/02

Classification Change:
__X__ Yes ___No

Shoreline Survey Completed: __Yes__

Prior Report & Date: Annual 2002

(I)ncreased/(D)ecreased/(N)one
__N__ Approved
__I__ Cond. Approved
__D__ Restricted
__N__ Prohibited

SUMMARY

Freshwater inflow from Santee River into Area 06A, in combination with localized rainfall, is the major contributor to the moderately excessive fecal coliform levels detected throughout the estuary. Freshwater flow in the North Santee Bay appears to be substantially less than in the North and South Santee Rivers thus allowing Atlantic Ocean water to impart a greater influence on water quality at Stations 04, 04A, 04B and 03. The bacteriological water quality summary indicates that portions of Area 06A can meet the requirements for the Conditionally Approved classification. The local SCDHEC district office has recently developed the capability to monitor real-time rainfall as measured at the U.S. Forest Service Office in McClellanville, South Carolina. This will allow effective and efficient monitoring of rainfall-induced pollution conditions within Area 06A.

INTRODUCTION

PURPOSE AND SCOPE

The authority to regulate the harvest, sanitation, processing and handling of shellfish is granted to the South Carolina Department of Health and Environmental Control by Section 44-1-140 of the Code of Laws of South Carolina, 1976, as amended. The Department promulgated Regulation 61-47 that provides the rules used to implement this authority and outlines the requirements applied in regulating shellfish sanitation in the State This regulation specifically addresses classification of shellfish harvesting areas and requires that all areas be examined by sanitary and bacteriological surveys and classified into an appropriate shellfish harvesting classification.

The National Shellfish Sanitation Program (NSSP) Guide For The Control Of Molluscan Shellfish is used by the United States Food and Drug Administration (USFDA) to evaluate state shellfish sanitation programs. The NSSP Model Ordinance requires that a sanitary survey be in place for each

growing area prior to its use as a source of shellfish for human consumption and prior to the area's classification as Approved, Conditionally Approved, Restricted, or Conditionally Restricted. Each sanitary survey shall be updated on an annual basis and accurately reflect changes which have occurred within the area. Requirement of the annual reevaluation include, at a minimum, field observations of pollution sources, an analysis of water quality data consisting of the past year's data in combination with appropriate previously collected data, review of reports and effluent samples from pollution sources, and review of performance standards for discharges impacting the growing area. A brief report documenting the findings shall also be provided.

The following criteria consistent with the NSSP Model Ordinance and S. C. Regulation 61-47 are used in establishing shellfish harvesting classifications:

Approved - Growing areas shall be classified Approved when the sanitary survey concludes that fecal material, pathogenic microorganisms, and poisonous or deleterious substances are not present in concentrations which would render shellfish unsafe for human consumption. Approved area classification shall be determined upon a sanitary survey, which includes water samples collected from stations in the designated area adjacent to actual or potential sources of pollution. For waters sampled under adverse pollution conditions, the median fecal coliform Most Probable Number (MPN) or the geometric mean MPN shall not exceed fourteen per one hundred milliliters, and not more than ten percent of the samples shall exceed a fecal coliform MPN of forty-three per one hundred milliliters (per five tube decimal dilution). For waters sampled under a systematic random sampling plan, the geometric mean fecal coliform Most Probable Number (MPN) shall not exceed fourteen per one hundred milliliters, and the estimated ninetieth percentile shall not exceed an MPN of forty three (per five tube decimal dilution). Computation of the estimated ninetieth percentile shall be obtained using ISSP Guidelines.

Conditionally Approved - Growing areas may be classified Conditionally Approved when they are subject to temporary conditions of actual or potential pollution. When such events are predictable as in the malfunction of wastewater treatment facilities, non-point source pollution from rainfall runoff, discharge of a major river, potential discharges from dock or harbor facilities that may affect water quality, a management plan describing conditions under which harvesting will be allowed shall be adopted by the Department, prior to classifying an area as "conditionally approved." Where appropriate, the management plan for each Conditionally Approved area shall include performance standards for sources of controllable pollution, e.g., wastewater treatment and collection systems, evaluation of each source of pollution, and means of rapidly closing and subsequent reopening areas to shellfish harvesting. Memorandums of agreements shall be a part of these management plans where appropriate.

Restricted - Growing areas shall be classified Restricted when sanitary survey data show a limited degree of pollution or the presence of deleterious or poisonous substances to a degree which may cause the water quality to fluctuate unpredictably or at such a frequency that a Conditionally Approved area classification is not feasible. Shellfish may be harvested from areas classified as Restricted only for the purposes of relaying or depuration and only by special permit issued by the

Department and under Department supervision. For restricted areas to be utilized as a source of shellstock for depuration, or as source water for depuration, the fecal coliform geometric mean MPN of restricted waters sampled under adverse pollution conditions shall not exceed eighty-eight per one hundred milliliters and not more than ten percent of the samples shall exceed a MPN of two hundred and sixty per one hundred milliliters for a five tube decimal dilution test. For waters sampled under a systematic random sampling plan, the fecal coliform geometric mean MPN shall not exceed eighty-eight per one hundred milliliters and the estimated ninetieth percentile shall not exceed an MPN of two hundred and sixty (five tube decimal dilution). Computation of the estimated ninetieth percentile shall be obtained using ISSP guidelines.

Conditionally Restricted - Growing areas may be classified Conditionally Restricted when they are subject to temporary conditions of actual or potential pollution. When such events are predictable, as in the malfunction of wastewater treatment facilities, non-point source pollution from rainfall runoff, discharge of a major river or potential discharges from dock or harbor facilities that may affect water quality, a management plan describing conditions under which harvesting will be allowed shall be prepared by the Department prior to classifying an area as Conditionally Restricted. Where appropriate, the management plan for each Conditionally Restricted area shall include performance standards for sources of controllable pollution, e.g., wastewater treatment and collection systems and an evaluation of each source of pollution, and description of the means of rapidly closing and subsequent reopening areas to shellfish harvesting. Memorandums of agreements shall be a part of these management plans where appropriate. Shellfish may be harvested from areas classified as Conditionally Restricted only for the purposes of relaying or depuration and only by permit issued by the Department and under Department supervision. For Conditionally Restricted areas to be utilized as a source of shellstock for depuration, the fecal coliform geometric mean MPN of Conditionally Restricted waters sampled under adverse pollution conditions shall not exceed eighty-eight per one hundred milliliters and not more than ten percent of the samples shall exceed a MPN of two hundred and sixty per one hundred milliliters for a five tube decimal dilution test. For waters sampled under a systematic random sampling plan, the fecal coliform geometric mean MPN shall not exceed eighty-eight per one hundred milliliters and the estimated ninetieth percentile shall not exceed an MPN of two hundred and sixty (five tube decimal dilution). Computation of the estimated ninetieth percentile shall be obtained using ISSP guidelines.

Prohibited - Growing areas are classified Prohibited if there is no current sanitary survey or if the sanitary survey or monitoring data show unsafe levels of fecal material, pathogenic microorganisms, or poisonous or deleterious substances in the growing area or indicate that such substances could potentially reach quantities which could render shellfish unfit or unsafe for human consumption.

BACKGROUND INFORMATION

Area 06A consists of the North and South Santee Rivers and North Santee Bay and their tributaries including Beach, Mosquito, Big Duck, Duck, Little Duck, Minim, Sand, and Cork Creeks. Other tributaries include Meadow, Kimloch, Sixmile, Pleasant, Montgomery, Hampton and Atchison Creeks. Fourmile Creek Canal connects the two rivers and Bird Bank Creek is tributary to the Atlantic

Ocean. The southern boundary of the area is the mid-channel of the South Santee River; the western boundary is the U. S. Highway 17 Bridge traversing the North and South Santee Rivers. The area is bounded on the north by Minim Creek Canal and portions of South and Cat Islands, and the eastern boundary is the Atlantic Ocean. The harvesting classification of Area 06A prior to this sanitary survey was as follows:

Prohibited: None:

Restricted: All portions of Area 06A.

Conditionally Approved: None

Approved: None.

The shellfish industry in South Carolina is based on harvest of the eastern oyster (*Crassostrea virginica*) and hard clams, which include both the northern clam (*Mercenaria mercenaria*) and several small populations of the southern clam (*Mercenaria campechiensis*). *C. virginica* have been harvested from Area 06A only during the closed shellfish season for Culture Permit reseeding purposes. These relay projects have been jointly permitted and supervised by the South Carolina Department of Health and Environmental Control (SCDHEC) and the South Carolina Department of Natural Resources (SCDNR). SCDHEC has not granted approval for mechanical depuration or wet storage activities in Area 06A.

Area 06A is routinely evaluated by SCDNR in order to determine resource productivity. SCDNR uses the State shellfish ground designation for these commercial activities. SCDNR has identified a population of hard clams in the vicinity of Stations 03, 04, & 04B. Commercial harvest difficulties (subtidal, isolated) make illegal commercial harvest activities highly unlikely.

Shellfish harvesting season in South Carolina extends from September 16 through May 14. SCDNR has the authority to alter the shellfish-harvesting season for resource management purposes. Additionally, SCDHEC has the authority to prohibit shellfish harvesting when necessary to ensure that shellfish harvested in South Carolina waters are safe for human consumption.

POLLUTION SOURCE SURVEY

SURVEY PROCEDURES

The Waccamaw District Shellfish Sanitation staff conducted a Shoreline survey of uplands immediately adjacent to Area 06A growing waters by watercraft during the survey period. Extensive visual examination of lands adjacent to the waters of Area 06A was conducted to determine potential sources of pollution entering shellfish growing waters. The Area 06A shellfish growing area (Santee River Delta) is remote and essentially undeveloped..

POINT SOURCE POLLUTION (See Figure #4)

A. **Municipal and Community Waste Treatment Facilities -** There are no wastewater treatment facilities located within the boundaries of Area 06A. The Town of Saint Stephens, approximately thirty miles upstream of Area 06A, has a National Pollutant Discharge Elimination System permit (SC0025259) with a rated flow limit of 0.450 MGD of treated effluent and a true flow of approximately 0.140 MGD. Additionally, Georgetown County Water and Sewer's North Santee WWTP is located slightly upstream of the Area 06A boundary on the North Santee River. This small facility has a rated flow of 0.0520 MGD, however, true flow is 0.024 MGD.

B. **Industrial Waste -** No industrial discharges are located within the boundaries of Area 06A.

C. **Marinas -** No marinas are located within Area 06A.

D. **Radionuclides** - Sources of radionuclides have not been identified within Area 06A, and radionuclide monitoring has not been conducted.

NONPOINT SOURCE POLLUTION

A. **Urban and Suburban Stormwater Runoff** - Area 06A contains no urban areas. A 1972 study (The Santee-Cooper River Basin Water Quality Management Plan) conducted by SCDHEC addressed problems associated with nonpoint source stormwater runoff in the Santee River basin upstream from Area 06A. The area described in that study consisted of drainage into the North and South Santee Rivers near the Atlantic Ocean. The study found that water quality problems consist primarily of fecal coliform bacteria contamination associated with a large number of nonpoint source discharges and a high prevalence of livestock and poultry operations.

Future studies related to rediversion impacts on the Santee River basin system may more fully assess and update these nonpoint source impacts on waters within the boundaries of Area 06A.

B. **Agricultural Runoff -** Water and sediment samples were collected during 1999 for purposes of metals, pesticide and herbicide analysis. The results of these analyses were unavailable for inclusion in this document.

C. **Individual Sewage Treatment and Disposal (ISTD) Systems** - Domestic dwellings are extremely sparse in Area 06A. Several families reside on South and Cat Islands in association with the Tom Yawkey Wildlife Center. Additional structures include shop and maintenance facilities, four graduate student dormitories and a recreation hall. All structures are serviced by ISTD systems. All systems are located in areas of sandy soil. (Joyner, pers. comm.)

The Cane Island Hunt Club, a small hunting shack located on upper Cane Island, utilizes a privy system for infrequent use.

D. **Wildlife and Domestic Animals** - The Tom Yawkey Wildlife Center, which is utilized for purposes of waterfowl management, is comprised of approximately 4325 acres of uplands, 6235 acres of wetlands, 314 acres of beach, and 2374 acres of impoundments and nontidal freshwater. Waterfowl are abundant especially during spring and autumn migrations.

Area 06A and surrounding lands support natural populations of rabbit, white-tailed deer, raccoon, opossum, alligators, rodents, songbirds and shorebirds typical of the coastal Carolinas. Populations of feral hogs and scrub goats in the salt marshes of the Santee delta and adjacent sea islands represent probable sources of fecal coliform contamination. Domestic animal population in the area is sparse. Cattle and poultry farming operations exist along the shorelines of the Santee River upstream from Area 06A boundaries; however, specific inventories of these have not been developed as part of the current survey. Distance from shellfish stocks and dilution minimize impacts on the growing waters of the area.

E. **Boat Traffic** - No designated marinas are located within the boundaries of Area 06A. Recreational boat traffic is light except for Atlantic Intracoastal Waterway (AIWW) travel during peak summer months.

F. **Hydrologic and Habitat Modification** - Historical changes have had major impacts on the habitat modification of the Santee delta. A serious shoaling problem developed in Charleston Harbor subsequent to the completion of the Santee-Cooper Diversion Project in 1942. The purpose of the project was to generate hydroelectric power and provide a navigation channel to the confluence of the Wateree and Congaree Rivers at Columbia, a distance of 105 miles. The project included a single lock and dam at Pinopolis (Lake Moultrie), a dam on the Cooper River and Spillway (Lake Marion), a dam on the Santee River, and a diversion canal between Lake Moultrie and Lake Marion. The diversion project increased the average flow in the Cooper River from 72 cubic feet per second (cfs) to 15,000 cfs and greatly increased dredging requirements in Charleston Harbor. (U.S. Army Corps of Engineers, 1983) As a result of this diversion, substantial oyster and clam recruitment occurred in the lower portions of Santee River system.

The Cooper River Rediversion Project, completed in August 1985, redirected approximately 80 percent of the fresh water from the Cooper River back into the Santee River. This redirection reduced freshwater inflow to the Cooper River from an average of 15,600 cfs to 3,000 cfs. The reduction in flow was projected to reduce shoaling in the Harbor by 70 percent. (Federal Energy Regulatory Commission, 1981) Flow from Lake Marion Spillway, Saint Stephens hydroelectric generating station, and Lake Marion hydroelectric generating station reaches the lower Santee Rivers and surrounding waters of Area 06A approximately 72 hours from time of release. As expected, rediversion has had a major influence on the hydrography of the North and South Santee Rivers, as well as the portions of the AIWW southward to the

northern boundary of Area 8 in the vicinity of Moores Landing. Recruitment of oyster and clam stocks has been substantially reduced subsequent to the rediversion project. (South Carolina Wildlife and Marine Resources Department, pers. comm.)

HYDROGRAPHIC AND METEOROLOGICAL CHARACTERISTICS

PHYSIOGRAPHY

Area 06A is comprised of portions of the Santee River system and adjacent uplands. The Santee River extends southeast from Lake Marion and reaches the Atlantic coast in southeastern Georgetown County. The lower eighteen-mile section of the Santee River is divided into two channels known as the North Santee and South Santee Rivers. Area 06A Shellfish Management Area consists of North Santee River and its tributaries including North Santee Bay, Beach, Mosquito, Big Duck, Duck, Little Duck, Minim, Sand, Cork, Pleasant Meadow, Kimloch, Sixmile and Atchison Creeks. It also includes the South Santee River and its tributaries including Pleasant, Montgomery, and Hampton Creeks. Fourmile Creek Canal connects the two rivers. Bird Bank Creek is tributary to the Atlantic Ocean. The southern boundary of the area is the South Santee River. The U. S. Highway 17 bridges traversing the North and South Santee Rivers define the western boundary. Minim Creek Canal and portions of South and Cat Islands bound the area on the north, and the eastern boundary is the Atlantic Ocean. The existing navigable channel follows the northern route. The Santee River is connected to Winyah Bay and other coastal harbors by the AIWW, which crosses the river system approximately five miles west of the Atlantic Ocean.

Tides - Tides in Area 06A are semidiurnal, consisting of two low and two high tides occurring each lunar day. Mean tidal range in the area varies from 4.1 feet to 4.5 feet during normal tides and 4.2 feet to 5.3 feet during spring tides. (Tides and Currents for Windows) Wind direction and intensity, as well as atmospheric pressure, typically result in variations of predicted tidal ranges.

Rainfall - Precipitation in Area 06A averages approximately 49 inches per year (South Carolina Department of Natural Resources), although the Wambaw Ranger Station at McClellanville, S.C. has recorded 62 inches of rain per year during 2000 and 2002. In 2001 much of South Carolina was in a drought. Area 06A was affected by the drought conditions receiving only 37 inches of rainfall. From June through September, the area typically receives approximately 21 inches of precipitation. Tropical storms and hurricanes occasionally produce extremely large amounts of rainfall. During the winter months (December through February), heavy rainfall events are uncommon, yet occasional intense thundershowers associated with rapidly moving low pressure systems generate heavy rains. Precipitation rarely occurs in the form of snow or ice. Spring weather patterns may be dynamic and intense, hail-producing thunderstorms are common. These storms occasionally favor the formation of tornados. A review of rainfall data from McClellanville, S.C. suggests that elevated fecal coliform levels may be more strongly associated with moderately intense localized rainfall events than with elevated river flows. Data also suggest that these impacts are relatively short-lived.

Winds - Prevailing winds along the northern portion of the South Carolina coast are generally from the South-Southwest during the spring and summer and from the North-Northeast during autumn and winter. Surface wind speeds average 6-10 mph (South Carolina Department of Natural Resources); however strong weather systems may generate winds hurricane force winds. Tropical storms and hurricanes may be anticipated during the summer and autumn. "Northeasters", which generate high winds and heavy rains, frequently occur during late autumn and early winter months.

River Discharges - Historical change, described in the previous section on Hydrologic and Habitat Modification, has had major impacts on the hydrography of the Santee River delta. Rediversion and its associated increase in flow rates have resulted in a change in the salinity profile of the entire area. A 1983 publication by the United States Army Corps of Engineers predicted that rediversion would result in the salinity front to advance in Charleston Harbor and to recede in the Santee River estuary. An ongoing study conducted by the South Carolina Department of Natural Resources (formerly the South Carolina Wildlife and Marine Resources Department) found that in 1986 "during high flow period there was a 'remarkable' shift in the salinity regimes of both rivers with salinity decreases downriver to near the mouth." The study stated that as of 1986, even during drought (low flow) conditions, average salinities in the lower part of the Rivers have fallen between 10 and 14 parts per thousand since rediversion. Salinity data collected by SCDHEC during routine sampling generally concur with these findings and indicate a steady decline of salinities at all sample stations since rediversion. Mean salinities measured during routine shellfish water quality monitoring within Area 06A during the period January 1992 through December 2002 ranged from 2.11 ppt to 23.73 ppt.

Mean salinities during the three-year review period ranged from 9.08 ppt to 23.73 ppt. A review of United States Geological Survey data for gauging station 02171700 (Santee River near Jamestown, S.C.) indicates that, for the period October 1987 to September 1998, the maximum monthly mean flow for January and February occurred during the 1998 water year (Jan.-Feb., 1998). Only moderately elevated fecal coliform levels (mean of 43) were detected this period. Mean flows were substantially less during the winter period of the 1999 water year (Dec., 1998-Feb., 1999); however, fecal coliform levels were substantially higher (mean of 546). During this report period river flow has had little effect on water quality in area 6A. This may be due to the drought that South Carolina has experienced over the last four years. While the coastal areas continue to have high rainfall events, the interior portions have had only sparse precipitation. The Santee drainage basin extends well above Columbia and low rainfall in the upper state has reduced the effect of river flooding in area 06A. For this reason, local rainfall events appear to have greater influence that river flow. River levels verses bacteria data from area 06A can be seen in Table 05.

Currents - Currents within Area 06A are influenced by ocean tides, winds and river flow. Under low river flow conditions, surface water movement essentially flows in an upstream direction for approximately six hours, becomes slack, and then ebbs for approximately six hours. Under high river flow conditions, surface currents move downstream throughout the entire tidal cycle.

WATER QUALITY MONITORING RESULTS

The Department currently utilizes a systematic random sampling (SRS) strategy within Area 06A in lieu of sampling under adverse pollution conditions. In order to comply with NSSP guidelines, a minimum of thirty samples are required to be collected and analyzed from each station during the review period. Sampling dates are computer generated prior to the beginning of each quarterly period thereby insuring random selection with respect to tidal stage and weather. Day of week selection criteria is limited to Mondays, Tuesdays, and Wednesdays due to shipping requirements and laboratory manpower constraints. Sample schedules are rarely altered.

During July 1998, an updated data collection and analysis procedure was formalized. Samples utilized for classification purposes are limited to those samples collected in accordance with the SRS for a 36-month period beginning January 1 and ending December 31. This allows for a maximum of 36 samples per station yet provides a six-sample "cushion" (above the NSSP required 30 minimum) for broken samples, lab error, breakdowns, etc. This also allows each annual report to meet the NSSP Triennial Review sampling criteria.

Three hundred and twenty-seven water samples (<1.0 ft. deep) were collected for bacteriological analyses and classification purposes from eight active water quality sampling stations in Area 06A during the period 01/01/00 through 12/31/02. The samples were collected in 120 ml amber glass bottles, immediately placed on ice and transported to the Waccamaw District Environmental Quality Control office in Myrtle Beach. The samples were then repacked using "cold packs" and delivered to the Greyhound Bus depot in Myrtle Beach for overnight delivery to the South Carolina Department of Health and Environmental Control's Trident District Environmental Quality Control laboratory at North Charleston, South Carolina. An additional 120 ml water sample was included with each shipment as a temperature control. Upon receipt at the laboratory, sample sets that exceeded a 30-hour holding time or contained a temperature control > 10 degrees C. were discarded.

Samples collected after September 1, 1986 have been analyzed using the five-tube/three dilution modified A-1 method described by Nuefeld (1985).

Surface water temperatures were measured utilizing hand-held, laboratory-quality calibrated centigrade thermometers. Salinity measurements were measured in the laboratory using automatic temperature compensated refractometers. Additional recorded field data include ambient air temperature, wind direction, tidal stage and date and time of sampling. Tidal stages were determined Nautical Software's Tides and Currents, Version 2 (1996).

A query of all data collected and analyzed for the period January 2000 through December 2002 indicate that only stations 01 and 11 exceeded a fecal coliform MPN geometric mean value of 14. Stations 02, 04, 04a, and 04b did not exceed a fecal coliform MPN estimated 90th percentile value of 43. No station exceeded a fecal coliform geometric mean MPN value of 88 nor did any station exceed a fecal coliform estimated 90th percentile value of 260. A query of data, which excluded samples collected during periods of high rainfall yielded results that indicated substantial improvement in statistical

water quality. Stations 03, 04, 04A, and 04B met Approved area criteria, while stations 01, 01A, 04C, 05, and 11 met the statistical criteria for a Restricted classification. Fecal coliform bacteriological raw data collected between 01/01/00 and 12/31/02 are included in Table 2.

CONCLUSIONS AND RECOMMENDATIONS

Although freshwater inflow via the upper Santee River contributes to fecal coliform loading throughout the estuary, localized rainfall events appear to coincide with more substantially elevated fecal coliform levels. These rainfall-induced fecal coliform increases appear to be temporally limited. Freshwater flow in the North Santee Bay is substantially less than in the North and South Santee Rivers and thus allows Atlantic Ocean water to impart a stronger influence on water quality throughout the bay (and to a slightly lesser extent the lower North Santee River). The bacteriological water quality summary indicates that portions Area 06A may be managed as Conditionally Approved based upon lack of rainfall in excess of 1.3 inches per 24 hours as recorded at the Wambaw Ranger station in McClellanville, S.C. This vital rainfall data was previously difficult to obtain in the timely manner necessary to manage this area. In July of 2002, SCDHEC reclassified the conditional area as Restricted because of this lack of management data. Recently the local SCDHEC office received permission to use the U.S. Forest Service's rain gauge at the Wambaw Forest Service Station. We are now able to connect directly to this rain station and download rain data as it occurs. This capability allows the Waccamaw District the ability to assess the status of this area by monitoring the rain events accurately and in a manner that will allow for a rapid response to adverse conditions.

Based upon the recommendations of this review, the harvesting classification of Area 06A will be:

Prohibited: None.

Restricted:

1) All portions of the North Santee River and North Santee Bay, including their tributaries, upstream of stations 03 and 04B;
2) All portions of the South Santee River and it's tributaries;
3) All portions of the Intracoastal Waterway and it's tributaries.

Conditionally Approved:

1)All portions of North Santee Bay seaward of Station 03 as well as those portions of the North Santee River seaward of Station 04B;
2) Portions of Santee Point immediately adjacent to North Santee Inlet.

Approved: None.

Monitoring Stations Amendments:

Addition: None

Deletion: None

Modification: None

REFERENCES

National Oceanic and Atmospheric Administration. 1995. *Tide tables 1995, high and low water predictions, East coast of North and South America including Greenland*. National Oceanic and Atmospheric Administration, Washington, D.C. 301 p.

Nuefeld, N. 1985. "Procedures of the Bacteriological Examination of Seawater and Shellfish." p. 37-63. In A. E. Greenberg and D. A. Hunt (ed.) *Laboratory procedures for the examination of seawater and shellfish*, Fifth Edition. American Public Health Association, Washington, D.C.

United States Department of Agriculture, Soil Conservation Service. 1986. *Soil survey of Horry County, South Carolina*. In cooperation with South Carolina Agricultural Experiment Station and South Carolina Land Resources Conservation Commission, National Cooperative Soil Survey, Washington, D.C. 137 p.

TABLE # 1

Shellfish Management Area 06A
WATER QUALITY SAMPLING STATIONS DESCRIPTION

Station	Description
01	South Santee River at Alligator Creek
01A	South Santee River near the midpoint of Grace Island (NEW**)**
02	South Santee Inlet
03	North Santee River at Beach Creek
04	North Santee Inlet
04A	North Santee Bay - E of Cane Island
04B	North Santee River - SW of Cane Island
04C	North Santee River near the Northwestern tip of Cane Island (NEW)
05	North Santee River and Mosquito Creek
11	Atlantic Intracoastal Waterway at Minum Creek

(Total 10)

Figure 1.

Shellfish Management Area 06A
Prior Classification

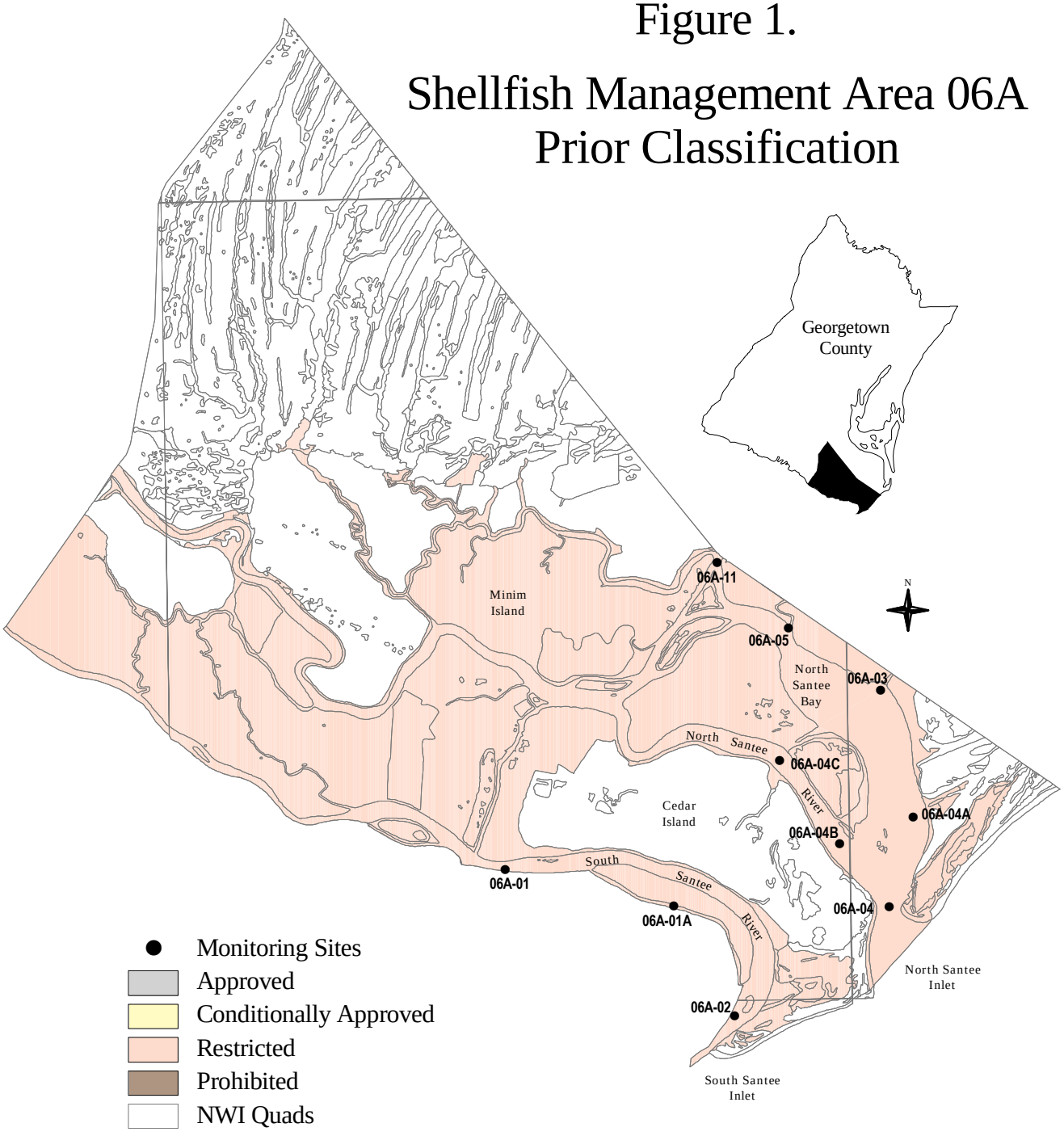

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Figure 2.

Shellfish Management Area 06A Current Classification

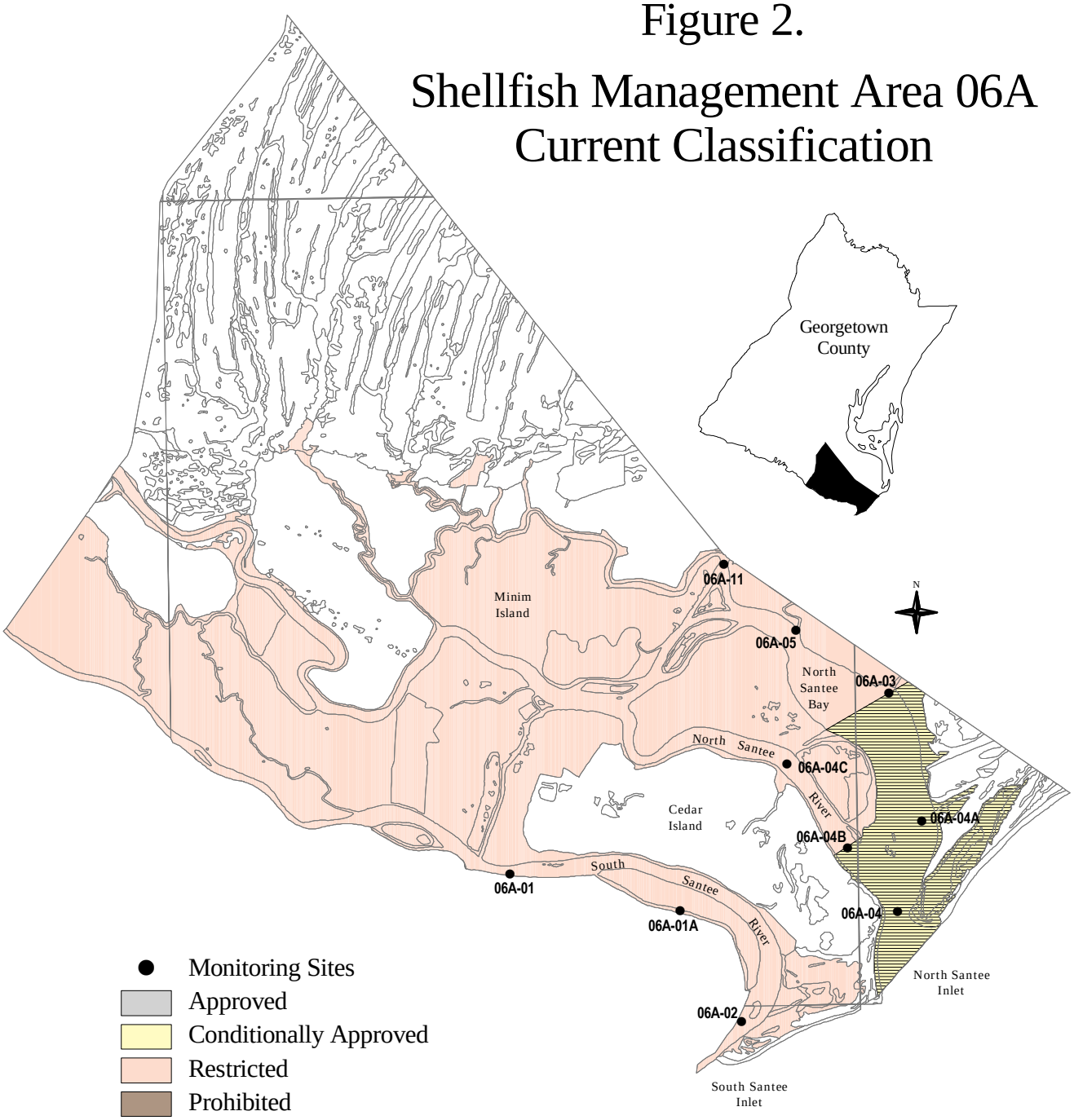

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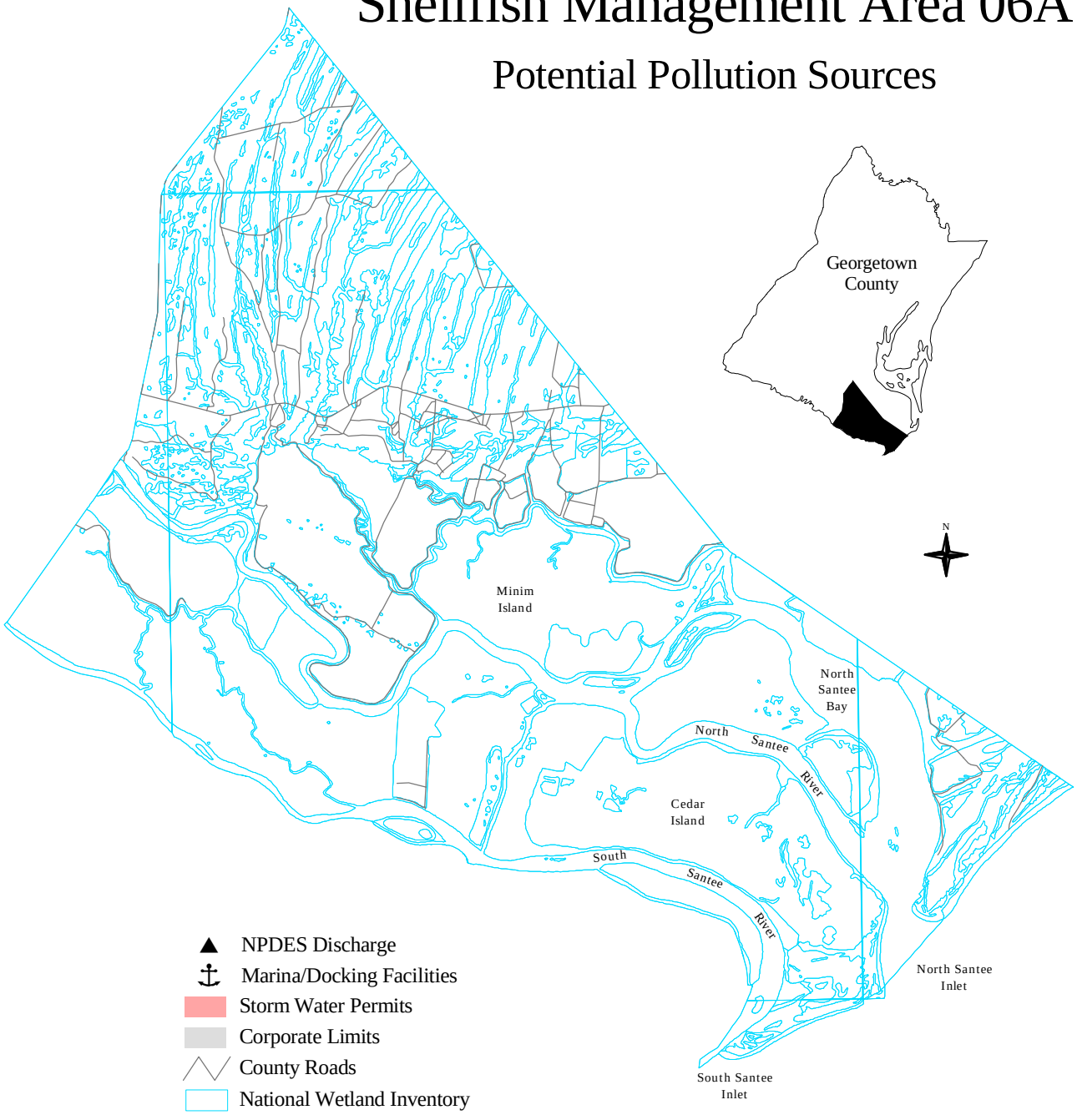
Figure 3.
Shellfish Management Area 06A
Potential Pollution Sources



2003 Annual Report

0.7 0 0.7 1.4 2.1 2.8 Miles

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TABLE # 2

Shellfish Management Area 06A

FECAL COLIFORM BACTERIOLOGICAL DATA SUMMARY
From Shellfish Water Quality Sampling Stations between

January 01, 2000 thru December 31, 2002

Station #	01	01A	02	03	04	04A	04B	04C	05	11
SAMPLES	36	17	36	36	36	36	36	22	36	36
GEOMEAN	26.4	8.9	8.2	9.2	4.5	5.2	5.4	11.2	10.8	16.0
90TH %ILE	202	55	39	50	18	20	22	48	44	63
WATERQLTY	R	New	A	R	A	A	A	New	R	R
CLASSIFICATION	R		R	R	CA	CA	CA		R	R

<u>Excluding Data Collected</u>:
February 2000, December 2001, February 2002, May 2002
January 01, 2000 thru December 31, 2002

Station #	01	01A	02	03	04	04A	04B	04C	05	11
SAMPLES	33	15	33	33	33	33	33	20	33	33
GEOMEAN	22	7.7	7.4	7.9	4.1	4.8	4.8	9.6	9.6	14.9
90TH %ILE	142	46	36	32	14	15	17	35	36	59
WATERQLTY	R	NEW	A	A	A	A	A	NEW	A	R
CLASSIFICATION	R		R	CA	CA	CA	CA	R	R	R

A - Approved **CA** - Conditionally Approved **R** - Restricted
R/ND - Restricted/No Depuration **P** – Prohibited

Table #3

WATER QUALITY SAMPLING STATIONS DATA

Shellfish Management Area 06A

BACTERIOLOGICAL DATA

Data for each shellfish station listed in this report's "Fecal Coliform Bacteriological Data Summary Table" and in other shellfish reports, can be obtained through South Carolina's Department of Health and Environmental Control - Freedom of Information office at the address below.

Freedom of Information
2600 Bull Street
Columbia, SC 29201

Any explanation or clarity needed on the report's content can be obtained by contacting the preparer(s), and/or reviewer(s) listed on the cover page.

Table #4

RAINFALL DATA

SOURCE:
Wambaw Ranger Station
McClellanville, S.C.
(Rainfall data in Bold indicates sample collection dates)

ANNUAL TABLE OF DAILY RAINFALL DATA

SOURCE: Wambaw Ranger District

Francis Marion National Forrest, McClellanville, SC

2000	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.00
2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.34	0.00	0.00	0.00
3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	1.52	0.00	0.00	0.14
4th	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.82	0.85	0.00	0.00	0.00
5th	0.17	0.00	0.01	0.00	0.00	0.14	0.00	0.64	5.49	0.00	0.00	0.00
6th	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.00	0.84	0.00	0.00	0.00
7th	0.32	0.00	0.00	0.00	0.00	0.00	2.60	0.00	0.00	0.00	0.00	0.00
8th	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00
9th	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10th	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	1.67
11th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.00	0.00	0.00
12th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.52	0.00	0.00	0.00	0.05
13th	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00
14th	0.00	1.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
15th	0.00	0.05	0.00	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16th	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
17th	0.00	0.00	0.32	0.00	0.00	0.64	0.00	0.00	0.00	0.00	0.12	0.15
18th	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.61	0.00	0.00	0.00
19th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.47	0.00	0.00	0.70	0.00
20th	0.20	0.00	1.55	0.00	0.00	0.11	0.00	0.00	0.00	0.00	1.08	0.09
21st	0.00	0.00	0.00	0.00	0.00	0.42	0.00	0.00	0.07	0.00	0.00	0.00
22nd	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.23	0.00	0.00	0.00
23rd	0.13	0.00	0.00	0.00	0.00	0.00	2.01	0.62	0.85	0.00	0.00	0.00
24th	0.60	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.20	0.00	0.00	0.00
25th	0.69	0.00	0.00	0.31	0.00	0.57	0.42	0.00	0.00	0.00	0.00	0.00
26th	0.00	0.00	0.00	0.00	1.34	0.08	0.03	0.00	0.00	0.00	2.12	0.00
27th	0.00	0.06	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28th	0.00	0.00	0.30	0.21	0.00	0.01	0.00	0.44	0.00	0.00	0.00	0.14
29th	0.00	0.00	0.00	0.00	0.46	0.28	2.57	1.03	0.00	0.00	0.00	0.79
30th	0.00		0.00	0.36	0.00	3.41	1.18	0.00	0.20	0.00	0.00	0.00
31st	0.80		0.00		0.00		0.22	0.00		0.00		0.00

(Monthly Figures) **Year's Rainfall Total: 62.01**

TOTAL	3.33	1.60	3.24	1.84	1.80	5.78	9.97	7.87	19.22	0.00	4.04	3.32
MAX	0.80	1.46	1.55	0.64	1.34	3.41	2.60	3.52	8.61	0.00	2.12	1.67
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AVG	0.11	0.06	0.10	0.06	0.06	0.19	0.32	0.25	0.64	0.00	0.13	0.11

(Shellfish Management Areas 06A, 06B, and 07.)

ANNUAL TABLE OF DAILY RAINFALL DATA

SOURCE: Wambaw Ranger District

Francis Marion National Forrest, McClellanville, SC

2001	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1st	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.67	0.00	0.00	0.00
2nd	0.00	0.00	0.00	0.00	0.00	0.14	0.01	0.13	0.00	0.00	0.61	0.00
3rd	0.00	0.00	1.00	0.00	0.00	0.00	1.13	0.20	0.17	0.00	0.01	0.00
4th	0.00	0.00	0.01	0.04	0.00	0.07	0.29	0.00	0.35	0.00	0.00	0.00
5th	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.00	0.05	0.00	0.00
8th	0.31	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00
9th	0.00	0.00	0.00	0.00	0.00	0.12	0.08	0.00	0.03	0.00	0.00	0.05
10th	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.21	0.00	0.00	0.00
11th	0.00	0.00	0.00	0.00	0.17	0.78	0.00	0.00	0.23	0.00	0.00	1.86
12th	0.30	0.51	0.72	0.00	0.00	1.51	1.86	0.00	0.20	0.00	0.00	0.00
13th	0.15	0.02	0.00	0.00	0.81	0.01	0.44	0.00	0.00	0.00	0.00	0.02
14th	0.00	0.01	0.00	0.00	0.00	0.40	0.19	1.22	0.11	0.03	0.00	0.19
15th	0.05	0.00	1.93	0.06	0.00	0.01	0.00	1.21	0.00	0.87	0.00	0.00
16th	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.03	0.00
17th	0.04	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
19th	0.00	0.00	0.00	0.00	0.00	0.32	0.04	0.18	0.00	0.00	0.01	0.00
20th	0.04	0.00	1.77	0.00	0.00	0.01	0.03	0.26	0.00	0.00	0.01	0.00
21st	0.00	0.00	0.62	0.00	0.00	0.10	0.21	0.07	0.00	0.00	0.00	0.00
22nd	0.00	1.04	0.00	0.00	0.00	0.04	0.00	0.01	0.00	0.00	0.00	0.00
23rd	0.00	0.00	0.00	0.00	0.92	0.00	0.15	0.00	0.00	0.00	0.00	0.04
24th	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.93	0.00
25th	0.00	0.00	0.27	0.44	0.00	0.91	0.00	1.02	0.43	0.00	0.26	0.00
26th	0.00	0.01	0.00	0.08	1.02	0.04	0.00	0.00	0.00	0.00	0.00	0.00
27th	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00
28th	0.00	0.08	0.00	0.00	0.00	0.00	0.68	0.00	0.00	0.00	0.00	0.00
29th	0.00		0.60	0.00	0.58	0.00	0.28	0.00	0.00	0.00	0.00	0.00
30th	0.08		0.05	0.00	0.06	0.00	0.18	0.00	0.00	0.00	0.00	0.00
31st	0.00		0.00				0.00	0.00		0.00		0.00

(Monthly Figures) **Year's Rainfall Total: 37.54**

TOTAL	0.97	2.01	6.97	0.62	3.56	4.88	6.47	4.57	2.40	0.95	1.86	2.28
MAX	0.31	1.04	1.93	0.44	1.02	1.51	1.86	1.22	0.67	0.87	0.93	1.86
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AVG	0.03	0.07	0.22	0.02	0.12	0.16	0.21	0.15	0.08	0.03	0.06	0.07

(Shellfish Management Areas 06A, 06B, and 07.)

ANNUAL TABLE OF DAILY RAINFALL DATA

SOURCE: Wambaw Ranger District

Francis Marion National Forrest, McClellanville, SC

2002	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1st	0.00	0.00	0.00	0.67	0.06	0.00	0.00	0.00	0.49	0.03	0.00	0.00
2nd	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.82	0.00	0.00	0.00
3rd	0.31	0.00	1.20	0.00	0.59	0.00	0.00	0.45	0.20	0.00	0.00	0.00
4th	0.05	0.00	0.05	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.19	0.00
5th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.01	0.19
6th	0.58	0.06	0.00	0.00	0.00	0.00	0.13	0.01	0.04	0.00	1.32	0.01
7th	0.01	1.60	0.00	0.00	0.00	0.00	0.54	0.03	0.00	0.00	0.00	1.32
8th	0.00	0.09	0.00	0.00	0.00	1.04	0.00	0.00	0.00	0.39	0.00	0.00
9th	0.00	0.00	0.06	0.00	0.00	0.00	0.48	0.00	0.00	0.08	0.00	0.00
10th	0.00	0.44	0.00	1.01	0.00	0.00	0.00	0.00	0.00	0.07	0.48	1.24
11th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.78	0.01	0.08
12th	0.00	0.00	0.02	0.28	0.00	0.00	2.07	0.00	0.00	0.00	1.12	0.00
13th	0.87	0.00	1.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.78
14th	0.00	0.00	0.00	0.15	0.28	0.00	0.31	0.00	0.02	1.64	0.00	0.07
15th	0.65	0.00	0.00	0.00	0.00	0.87	0.00	0.00	0.21	1.48	0.00	0.00
16th	0.00	0.06	0.00	0.00	0.00	0.00	1.70	0.00	1.72	0.02	0.06	0.00
17th	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.65	0.00
18th	0.00	0.00	0.00	0.00	0.00	0.73	0.00	0.00	0.06	0.00	0.17	0.00
19th	0.00	0.00	0.00	0.00	1.41	0.09	0.00	0.00	0.00	0.00	0.00	0.65
20th	0.05	0.00	0.00	0.00	0.00	0.52	0.00	0.00	0.00	0.00	0.00	0.13
21st	0.00	0.20	0.47	0.00	0.00	2.60	0.00	0.05	0.00	0.00	0.00	0.00
22nd	0.04	0.00	0.00	0.00	0.00	1.61	0.00	0.00	0.00	0.22	0.00	0.00
23rd	0.00	0.05	0.00	0.00	0.00	1.26	0.93	0.00	0.00	0.00	0.00	0.00
24th	0.00	0.01	0.00	0.00	0.00	0.04	0.33	0.00	1.09	0.08	0.00	0.44
25th	0.12	0.00	0.00	0.54	0.00	0.00	0.00	0.09	0.04	0.01	0.00	0.89
26th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	2.34	0.00	0.00	0.00
27th	0.00	0.00	0.44	0.27	0.00	0.00	0.14	1.58	0.00	0.00	0.00	0.00
28th	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.60	0.00	0.00	0.00	0.00
29th	0.00		0.00	0.00	0.00	0.35	0.00	2.09	0.00	0.09	0.00	0.00
30th	0.00		0.00	0.00	0.05	0.00	0.00	2.36	0.00	0.18	0.00	0.00
31st	0.00		0.00		0.00		0.00	0.23		0.00		0.00

(Monthly Figures) **Year's Rainfall Total: 63.38**

TOTAL	2.69	2.51	3.79	2.92	2.99	9.11	6.65	9.16	7.03	6.07	4.66	5.80
MAX	0.87	1.60	1.20	1.01	1.41	2.60	2.07	2.36	2.34	1.78	1.32	1.32
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AVG	0.09	0.09	0.12	0.10	0.10	0.30	0.21	0.30	0.23	0.20	0.16	0.19

(Shellfish Management Areas 06A, 06B, and 07.)

Table #5

RIVER LEVEL DATA
vs
BACTERIA SAMPLING DATA
(plus 5 days)

Shellfish Management Area 06A

River Level Data vs. Bacteria Sampling Data + 5 days

Date of Sampling	River Level	06-01	06A-02	06A-03	06A-04	06A-04A	06A-04B	06A-04C	06A-05	06A-11
1/14/2000	3									
1/15/2000	7.25									
1/16/2000	7.67									
1/17/2000	5.04									
1/18/2000	4.38									
1/19/2000	5.94	64	70	13	8	8	23		49	49
2/9/2000	8.31									
2/10/2000	6									
2/11/2000	4.49									
2/12/2000	4.71									
2/13/2000	6.19									
2/14/2000	6.81	350	22	14	5	5	13		13	33
3/23/2000	9.68									
3/24/2000	10.12									
3/25/2000	10.72									
3/26/2000	11.08									
3/27/2000	11.31									
3/28/2000	11.51	17	33	17	5	5	17		13	11
3/29/2000	11.65									
3/30/2000	11.6									
3/31/2000	11.42									
4/1/2000	11.29									
4/2/2000	11.12									
4/3/2000	10.93									
4/4/2000	10.65									
4/5/2000	10.23	22	4	5	1.9	1.9	7		8	5
5/11/2000	1.39									
5/12/2000	1.14									
5/13/2000	83.18									
5/14/2000	1.05									
5/15/2000	1.02									
5/16/2000	0.91	8	5	49	33	33	46		5	2
6/1/2000	3.12									
6/2/2000	2.63									
6/3/2000	2.54									
6/4/2000	2.82									
6/5/2000	2.78									
6/6/2000	2.46	21	2	13	1.9	1.9	5		11	13
7/5/2000	1.41									
7/6/2000	1.29									
7/7/2000	0.85									
7/8/2000	137.12									
7/9/2000	437.49									
7/10/2000	656.12	8	2	5	2	2	2		5	4
8/18/2000	2.3									

Date of Sampling	River Level	06-01	06A-02	06A-03	06A-04	06A-04A	06A-04B	06A-04C	06A-05	06A-11
8/19/2000	**2.17**									
8/20/2000	**2.68**									
8/21/2000	**2.71**									
8/22/2000	**2.77**									
8/23/2000	**2.51**	46	5	2	1.9	1.9	2		7	7
9/7/2000	**3.42**									
9/8/2000	**3.11**									
9/9/2000	**2.79**									
9/10/2000	**2.66**									
9/11/2000	**2.58**									
9/12/2000	**2.77**	70	33	2	1.9	1.9	5		13	49
10/11/2000	**2.47**									
10/12/2000	**2.47**									
10/13/2000	**2.54**									
10/14/2000	**2.51**									
10/15/2000	**2.46**									
10/16/2000	**2.51**	2	2	1.9	1.9	1.9	1.9		2	5
11/15/2000	**2.55**									
11/16/2000	**2.55**									
11/17/2000	**2.4**									
11/18/2000	**2.31**									
11/19/2000	**2.59**									
11/20/2000	**2.63**	130	17	33	11	11	17		17	22
12/8/2000	**2.25**									
12/9/2000	**2.14**									
12/10/2000	**2.81**									
12/11/2000	**2.81**									
12/12/2000	**2.6**									
12/13/2000	**2.58**	23	79	1.9	2	2	1.9		1.9	8
12/29/2000	**2.43**									
12/30/2000	**1.96**									
12/31/2000	**1.63**									
1/1/2001	**1.64**									
1/2/2001	**1.55**									
1/3/2001	**1.91**	7	1.9	1.9	1.9	1.9	1.9		1.9	8
2/15/2001	**1.93**									
2/16/2001	**1.93**									
2/17/2001	**1.94**									
2/18/2001	**2.3**									
2/19/2001	**2.3**									
2/20/2001	**1.98**	49	21	11	7	7	5		23	23
3/2/2001	**2.52**									
3/3/2001	**1.95**									
3/4/2001	**2.45**									
3/5/2001	**2.59**									
3/6/2001	**2.6**									
3/7/2001	**3.03**	110	17	13	8	8	2	11	13	27

Date of Sampling	River Level	06-01	06A-02	06A-03	06A-04	06A-04A	06A-04B	06A-04C	06A-05	06A-11
4/6/2001	9.94									
4/7/2001	10.59									
4/8/2001	10.81									
4/9/2001	10.12									
4/10/2001	9.95									
4/11/2001	9.37	33	27	33	8	8	13	33	79	33
5/25/2001	2.61									
5/26/2001	2.74									
5/27/2001	2.25									
5/28/2001	2.44									
5/29/2001	2.18									
5/30/2001	2.78	23	7	13	8	8	17	8	13	33
6/21/2001	2.07									
6/22/2001	2.12									
6/23/2001	2.48									
6/24/2001	2.42									
6/25/2001	2.52									
6/26/2001	2.46	11	8	8	2	2	2	5	8	11
7/25/2001	2.32									
7/26/2001	2.13									
7/27/2001	1.99									
7/28/2001	2.15									
7/29/2001	2.32									
7/30/2001	1.9	14	17	17	12	12	5	23	13	23
8/9/2001	2.16									
8/10/2001	2.43									
8/11/2001	2.06									
8/12/2001	1.73									
8/13/2001	1.8									
8/14/2001	1.66	49	8	5	8	8	13	13	23	33
8/28/2001	2.05									
8/29/2001	1.79									
8/30/2001	1.93									
8/31/2001	1.91									
9/3/2001	2.49									
9/4/2001	2.5	31	5	2	13	13	1.9	5	5	23
9/27/2001	2.14									
9/28/2001	2.21									
9/29/2001	2.38									
9/30/2001	7.82									
10/1/2001	2.75									
10/2/2001	2.95	11	2	1.9	1.9	1.9	2	1.9	2	4
11/14/2001	2.95									
11/15/2001	2.8									
11/16/2001	2.83									
11/17/2001	2.6									
11/18/2001	2.4									

Date of Sampling	River Level	06-01	06A-02	06A-03	06A-04	06A-04A	06A-04B	06A-04C	06A-05	06A-11
11/19/2001	**2.5**	1.9	5	1.9	1.9	1.9	1.9	1.9	2	5
7/12/2002	**2.47**									
7/13/2002	**2.63**									
7/14/2002	**2.3**									
7/15/2002	**2.32**									
7/16/2002	**84.11**									
7/17/2002	**2.31**	17	4	5	4	4	5	13	14	46
8/14/2002	**2.44**									
8/15/2002	**2.39**									
8/16/2002	**1.78**									
8/17/2002	**1.81**									
8/18/2002	**1.57**									
8/19/2002	**1.98**	4	2	5	1.9	1.9	2	13	5	1.9
9/6/2002	**2.45**									
9/7/2002	**2.76**									
9/8/2002	**2.75**									
9/9/2002	**2.67**									
9/10/2002	**2.75**									
9/11/2002	**2.66**	2	2	1.9	1.9	1.9	1.9	4	2	8
10/11/2002	**3.71**									
10/12/2002	**3.9**									
10/13/2002	**3.75**									
10/14/2002	**3.81**									
10/15/2002	**4.21**									
10/16/2002	**3.91**	1600	110	33	95	95	33	95	46	46
11/20/2002	**3.67**									
11/21/2002	**5.07**									
11/22/2002	**6.05**									
11/23/2002	**6.48**									
11/24/2002	**6.67**									
11/25/2002	**7.06**	46	1.9	79	2	2	2	8	23	64
12/11/2002	**7.53**									
12/12/2002	**8.15**									
12/13/2002	**8.68**									
12/14/2002	**9.22**									
12/15/2002	**9.65**									
12/16/2002	**10.21**	7	11	21	5	5	8	13	22	79

CONDITIONAL AREA MANAGEMENT PLAN

Shellfish Management Area 06A

Area 6A Conditional Area Management Plan
January 01, 2004

I. AREA DESCRIPTION

The following is a description of the area 06A Conditionally Approved area as indicated in the 2003 Annual Update:

> *All portions of North Santee Bay seaward of Station 03, as well as those portions of the North Santee River seaward of Station 04B.*

A map indicating the North Santee Bay Conditionally Approved area boundaries is included in the 2003 Annual Report.

II. Factors Indicating Suitability of Area 06A as a Conditionally Approved Area

A. The major pollution source adversely affecting water quality in Area 06A is nonpoint source in origin. The area is somewhat geographically isolated and practically devoid of human habitation.

B. Resource within Area 06A is primarily subtidal and as such requires specialized harvest equipment.

III. PREDICTABLE POLLUTION EVENTS

A. Meteorological Events

1. Areas will be closed upon receipt of 1.30 inches or more of rainfall within 24 hours as officially measured at the Wambaw Ranger Station, McClellanville, South Carolina.

2. Sanitary Surveys have indicated that a 24 hour rainfall total of 1.30 inches results in an overall degradation of water quality, while lesser amounts occurring in 24 hours do not appear to result in adverse affects.

3. An historical analysis of precipitation for the forty-year period 1958 thru 2002 indicates that, excluding the months of June through August, McClellanville will receive an average of six rainfall events per year equal to or greater than 1.30 inches. During the forty-year period, McClellanville recorded a total of 253 rainfall events equal to or exceeding 1.30 inches/24 hours. No events were recorded

during 1968, while 20 were recorded during the 2000-2002 shellfish season. (From cirrus rain station McClellanville SC UCAN 17370, COOP: 385628.)

4. Although some events are likely to crossover, each event is considered to be separated from the subsequent event by a minimum duration of 14 days. With this in mind, based solely upon rainfall events, one could expect the Conditionally Approved portions of Area 06A to remain in an open status during 69% of the shellfish season.

B. Seasonal Events

1. Rainfall quantities are fairly uniform throughout fall, winter, and spring. Rainfall varies in intensity and duration, however, it is more uniform in nature during the winter months. Fall and spring rainfall patterns are typically more dynamic, with thunderstorms being quite common.

2. Sustained river flooding is often associated with winter/spring precipitation. Real-time river stage determination will be monitored via the Internet. Sustained levels in excess of 10.0 ft will result in closure. River levels will be read at the USGS Santee River monitoring station located at Jamestown, South Carolina (site 02171700). The Internet site used to gather this data is; http://www.dnr.state.sc.us/pls/hydro/river.dataform?stnid=02171700.

3. Any significant input from migratory waterfowl populations is offset by tidal flushing.

IV. Implementation of a Conditional Area Closure

A. Notification of management plan violation

1. DHEC is responsible for determining compliance with this management plan.

2. Rainfall measurements are checked daily (am) at several locations along South Carolina's northern coast. If the Georgetown Fire Department gauge (via internet) indicates 0.5 inches or more, a SCDHEC officer will contact the Wambaw Ranger station rain gauge via telephone to determine the amount of rainfall in that area. Daily river stage checks will be implemented (via internet).

3. Determination of precipitation violation will normally transpire within 16 hours. River stage violations are immediate.

4. Conditionally Approved portions of Area 06A will remain in a closed (Restricted) status from June 1 through September 15.

B. Implementation of Closure (September through May)

1. If determination of a violation occurs during working hours (8:30 - 5:00), a press release will normally be issued within four hours. If a determination of a violation occurs after normal working hours, a press release will be issued by the following noon.

2. Notification will be provided by fax or telephone to the South Carolina Department of Natural Resources (Marine Resources & Richmond Law Enforcement.

3. DHEC is the primary patrol agency for shellfish sanitation. Officers are on call 24 hours per day.

C. Enforcement of Closure

1. DHEC is the agency responsible for public health protection. This includes public notice and closures of shellfish management areas.

2. Area 06A will be patrolled at increased frequencies during closures of Conditionally Approved areas unless conditions are such that a patrol is deemed to be unnecessary. DHEC patrol officers may coordinate with other law enforcement officers to insure adequate area coverage.

V. CONTROL ELEMENTS USED TO REOPEN AFTER A POLLUTION EVENT

Opening of areas following closure due to violation of management plan criteria shall adhere to the control elements.

A. The area shall remain closed for a minimum period of 14 consecutive days following the end of a rainfall event. River stage consistently above 10.0 will require closure. If, during the initial closure period, a subsequent event occurs that meets the criteria for a closure, the area shall remain closed for 14 consecutive days following the occurrence of the subsequent event.

B. The bacteriological water quality at all stations located within, or on the boundary of, the closed Conditionally Approved area shall be assessed prior to reopening. For the period beginning January 2004, the following stations shall be sampled prior to

reopening: 04, 04A, 04B, and 04C. The area shall remain closed and be re-sampled at a later date if any sample exceeds a fecal coliform MPN of 43.

C. Waccamaw District Shellfish staff and the State Shellfish Program Manager (or his designee) shall concur on the decision to reopen the area.

D. Waccamaw District Shellfish shall notify SCDNR, Division of Commercial Fisheries Management, of the opening immediately following issuance of the news release.

E. Local Certified Shippers within the McClellanville area shall be notified by SCDHEC of the opening as soon as possible.

F. The Area 06A classification status map shall be updated prior to reopening.

VI. MANAGEMENT PLAN Evaluation

This plan shall be evaluated once per year and included as a part of the Shellfish Management Area 06A Annual Update.